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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/736,945

12/15/2003

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C-2950

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08/18/2009

EXAMINER

LAIOS, MARIA J

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

08/18/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/736,945	Applicant(s) GESCHWINDT ET AL.	
	Examiner MARIA J. LAIOS	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 3,5-8 and 10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,9,11-14 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

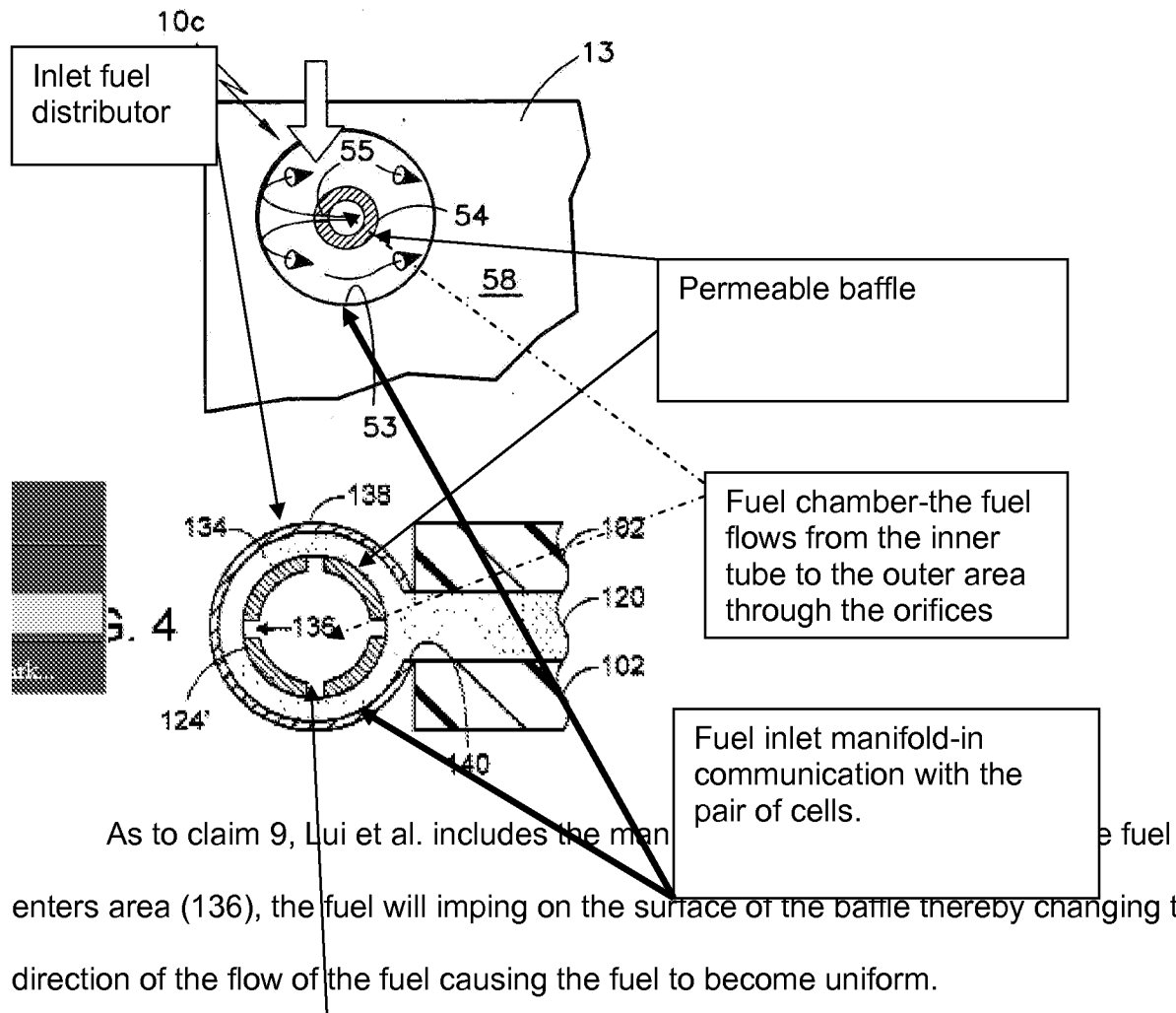
DETAILED ACTION

1. This office action is in response to the remarks filed 4 May 2009. None of the claims have been amended. Claims 1, 2, 4, 9, 11-14 are finally rejected for reasons of record.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 102

3. The claim rejections under 35 USC 102(e) as being anticipated by Lui et al. of claims 2, 4, 9 and 12 are maintained and provided below for convenience.

As to claims 2 and 4, Lui et al. discloses a fuel cell system comprising a pair of cells (Paragraph 26). Each of the cells will inherently have a fuel flow field and a fuel inlet and a fuel supply pipe. (See Figures below for a comparison match between applicants figure of the elected specie and Lui et al. figure)



As to claim 12, the fuel inlet distributor comprises a first internal manifold receiving fuel from the fuel supply pipe (area 136) a second internal fuel manifold (area 134) providing fuel to the fuel inlets and receiving fuel through the permeable baffle from the first internal fuel manifold (figure above).

Claim Rejections - 35 USC § 103

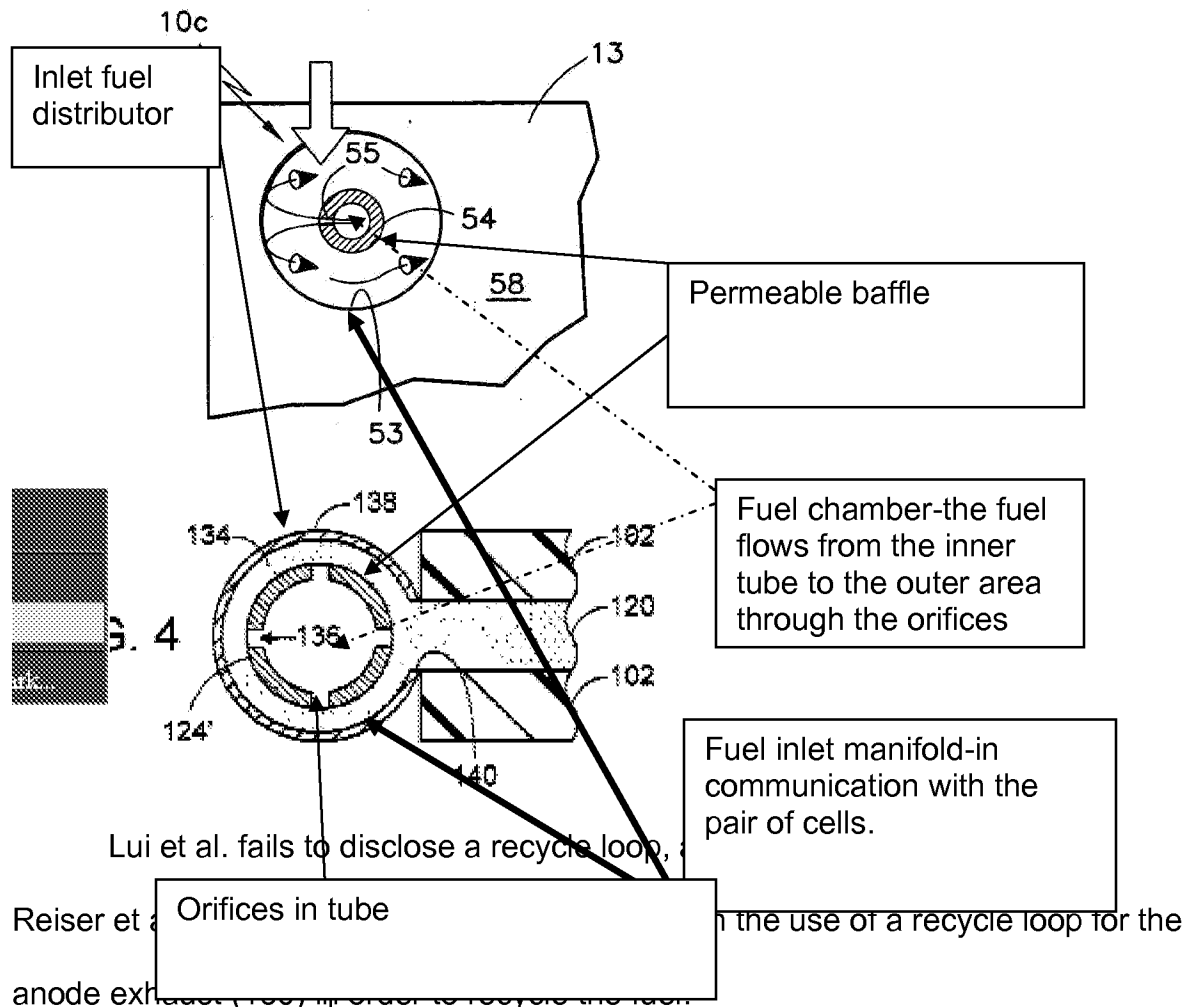
4. The claim rejection under 35 USC 103(a) as being unpatentable over Lui et al. of claim 11 is maintained and provided below for convenience.

Lui et al. discloses the fuel cell as discussed above and incorporated herein but fails to

taper the permeable baffle, to have the inlet end have a larger opening than the outlet end, in order to increase the pressure of the fuel as it travels in the tube it is well known in the art to narrow the tube a nozzle is formed which will increase the pressure at the outlet compared to the pressure at the inlet. It would have been obvious to one of ordinary skill at the time of the invention to taper the baffle in this manner so as to increase the pressure of the fuel toward the outlet where the amount of fuel is less than at the beginning thus insuring an equalized amount of fuel entering the fuel distributor.

5. The claim rejection under 35 USC 103(a) as being unpatentable over Lui et al. and Reiser et al. of claim 14 is maintained and provided below for convenience.

As to claim 14, Lui et al. disclose a plurality of fuel cells, each of the fuel cells have at least one fuel flow field and a fuel inlet and fuel outlet. Each of the cells will inherently have a fuel flow field and a fuel inlet and a fuel supply pipe. (See Figures below for a comparison match between applicants figure of the elected species and Lui et al. figure)



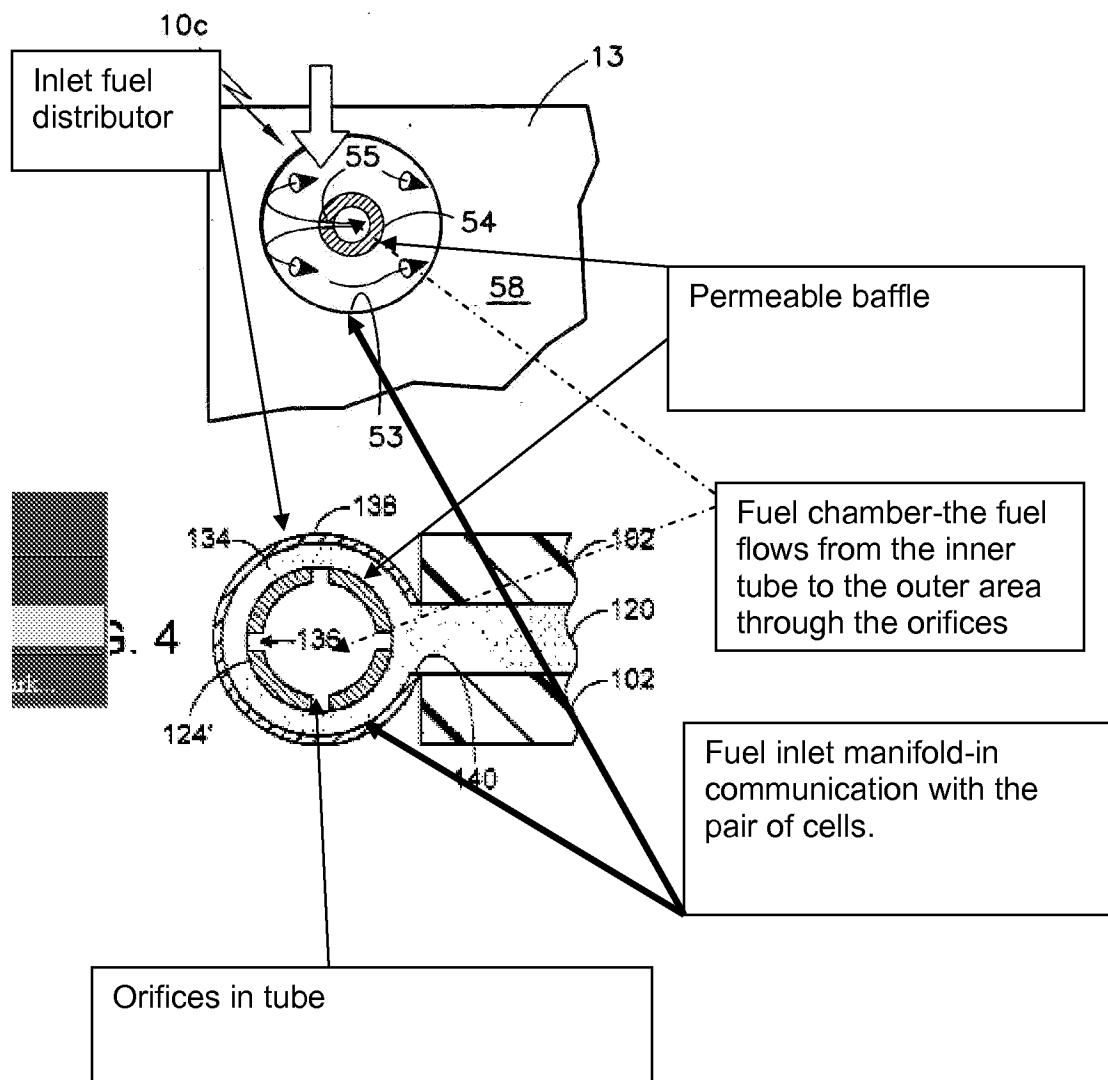
However Lui modified by Reiser fail to disclose the recycled fuel is provided down stream of the permeable baffle.

It would have been obvious to one of ordinary skill in the art at the time of the invention to replenish the fuel in the system because it would save the fuel from being expended. Furthermore the placement of the fuel downstream of the baffle would allow the recycled fuel to enter the cells directly and would further mix with the fuel entering from the orifices thus homogenizing the fuel entering the cells.

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6. The claim rejections under 35 USC 103(a) as being unpatentable over Lui et al., Reiser and LaPierre et al. of claims 1 and 13 is maintained and provided below for convenience.

As to claim 1 and 13, Lui et al. disclose a plurality of fuel cells, each of the fuel cells have at least one fuel flow field and a fuel inlet and fuel outlet. Each of the cells will inherently have a fuel flow field and a fuel inlet and a fuel supply pipe. (See Figures below for a comparison match between applicants figure of the elected specie and Lui et al. figure)



Lui et al. fails to disclose a recycle loop, an exhaust valve or a controller.

Reiser et al. discloses a fuel cell system and teach the use of a recycle loop for the anode exhaust (150) in order to recycle the fuel.

However Lui modified by Reiser fail to disclose the recycled fuel is provided down stream of the permeable baffle.

It would have been obvious to one of ordinary skill in the art at the time of the invention to replenish the fuel in the system because it would save the fuel from being expended. Furthermore the placement of the fuel downstream of the baffle would allow the recycled fuel to enter the cells directly and would further mix with the fuel entering from the orifices thus homogenizing the fuel entering the cells.

Reiser further discloses a valve (170) which is in fluid communication with the cells and is upstream from the manifold inlet. Since the valve is downstream of the exiting gas it will be located a distance from the interconnection of the fuel inlet chamber and the supply pipe. It would have been obvious to one of ordinary skill in the art to include a valve in the recycle system in order to control the amount of fuel being recycled.

Lui et al. modified by Reiser fail to disclose a controller controlling the valve. LaPierre et al. disclose a controller (150) for controlling the valves during start up. It would have been obvious to one of ordinary skill in the art at the time of the invention to include the controller of LaPierre et al. to the system of Lui modified by Reiser because the controller can adjust the valve to control the flow rate of the fuel (col. 17 lines 57- col. 18 line 5).

Response to Arguments

7. Applicant's arguments filed 4 May 2009 have been fully considered but they are not persuasive.

8. Applicant's arguments include:

a. Lui does not disclose each of the fuel cells having a least one fuel flow field and a fuel inlet manifold in fluid communication with all of the flow field inlets.

b. Lui relies on capillary action to move liquid it is not necessary to taper the inlet chamber.

c. *Reiser is cited as having a recycle loop. However, the conclusion of the rejection is that it would be obvious to replenish the fuel to save the fuel from being expended. That is irrelevant to claim 14 except in the most general sense. Furthermore, the concept that entering recycle fuel into the cells directly would =further mix* and homogenize the fuel is believed to not be true. Certainly, more mixing would occur if the recycle fuel were entered upstream of the baffle, since the neat fuel is upstream also. Homogenizing would more likely occur if the recycle fuel entered upstream of the baffle along with the neat fuel. In any event, there is nothing in either reference to suggest recycle fuel being entered downstream of the baffle. Furthermore, since there are four fuel cells and only two flow fields in Liu, there is not at least one flow field per fuel cell, which claim 14 requires in line 2. Further, there is no fuel inlet manifold that is "in fluid communication with all of the fuel flow field inlets" (claim 14, line 5), since the fuel supply channel 124 in Liu services only one fuel distribution element 120. Therefore, reconsideration and allowance of claim 14 over Liu and Reiser is respectfully requested.*

d. *The exhaust valve is to be upstream from the fuel inlet manifold and providing the recycle fuel into the fuel inlet manifold downstream of the baffle so the claimed valve is not involved with recycle at all.*

9. In response to the arguments:

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a and c. The examiner respectfully disagrees because each plate of the fuel cell would inherently have at least one fuel flow field, such as channels to distribute the fuel to the anode. Therefore each of the fuel cells has a fuel flow field. The fuel inlet manifold is in communication with the cells as seen in the figure above. Furthermore a plurality of cells can consist of only two cells thus the fuel inlet manifold would be in fluid communication with all of said fuel flow field inlets. The applicant's remarks with respect to the homogenizing the fuel is unclear. The fuel would mix in either case if the recycled fuel is upstream or downstream of the baffle since the fuels would interact with each other.

b. The wicking material (120) is located outside of the baffle thus argument that the capillary action not relevant since inside of the permeated tube (baffle) the pressure would increase.

d. The claim language of "comprising" does not exclude a recycle stream in claim 13. Claims 1 and 13 require the valve to be located at a distance from the interconnection of the fuel inlet chamber with the fuel supply pipe. Claims 1 and 13 state "an exhaust valve in fluid communication with said fuel inlet chamber upstream from said fuel inlet manifold" this states that the inlet chamber is upstream from the fuel inlet manifold and not the exhaust valve. Furthermore this interpretation coincides with elected species of figure 5 and 6 in which valve 57 is located at the exit of the fuel. Furthermore the controller of LaPierre controls the valves during start up of the system and adjusts the flow rate of the recycle stream (col. 17 lines 57-col. 18 lines 5).

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARIA J. LAIOS whose telephone number is (571)272-9808. The examiner can normally be reached on Monday - Thursday 10 am -7 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on 571-272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. J. L./
Examiner, Art Unit 1795

/Dah-Wei D. Yuan/
Supervisory Patent Examiner, Art Unit 1795